VASCULAR PLANT FLORA OF THE ALPINE ZONE IN THE SOUTHERN ROCKY MOUNTAINS, U.S.A.

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ABSTRACT

Field detection of changes in occurrence, distribution, or abundance of alpine plant species is predicated on knowledge of which species are in specific locations. The alpine zone of the Southern Rocky Mountain Region has been systematically inventoried by the staff and floristics graduate students from the Rocky Mountain Herbarium over the last 27 years. It is centered on the mountain ranges of Colorado and extends north to the Medicine Bow Mountains in southeast Wyoming and south into the Sangre de Cristo Range in north central New Mexico. It also includes the La Sal Mountains of Utah and the San Francisco Peaks in northern Arizona. The alpine meadow and treeline ecotone flora of the Southern Rocky Mountains includes 609 unique taxa of vascular plants comprising 581 species. The richest families are Asteraceae (104 species), Poaceae (58 species), Cyperaceae (57 species), and Brassicaceae (42 species). The central Colorado subregion is the most taxon rich (499) with richness tapering off to the north, southeast, and southwest. Non-endemic alpine zone taxa occur more frequently elsewhere in the Rocky Mountain Cordillera Floristic Region (515) than in the Madrean (373), Circumboreal (226), or North American Atlantic Floristic Regions (120). Levels of endemism within the flora of the alpine zone in the Southern Rocky Mountains range from single mountains (7) to the flora as a whole (59) including 25 taxa endemic to both the Southern Rockies and to its alpine zone. This checklist is based on vouchered specimens and should be most useful to botanists and land managers determining what taxa are likely to occur within their area of interest.

RESUMEN

La detección de cambios en ocurrencia, distribución, o abundancia de especies de plantas alpinas se predica como conocimiento de que especies están en lugares específicos. La zona alpina del sur de la Región de las Montañas Rocosas ha sido inventariada sistemáticamente por el personal y estudiantes de florística del Rocky Mountain Herbarium en los últimos 27 años. Está centrado en las cordilleras de Colorado y se extiende hacia el norte hasta las montañas Medicine Bow en el sureste de Wyoming y hacia el sur hasta la cadena Sangre de Cristo en el norte centro de Nuevo México. También incluye las montañas La Sal de Utah y los picos San Francisco en el norte de Arizona. La pradera alpina y la flora del ecotono de la línea arbolada del sur de las Rocky Mountains incluye 609 taxa únicos de plantas vasculares que comprenden 581 especies. Las familias más ricas son Asteraceae (104 especies), Poaceae (58 especies), Cyperaceae (57 especies), y Brassicaceae (42 especies). La subregión de Colorado central es la más rica en taxa (499) cuya riqueza disminuye hacia el norte, sureste, y suroeste. Los taxa no endémicos de la zona alpina ocurren más frecuentemente en cualquier lugar de la Región Florística de la Cordillera Rocky Mountain (515) que en la Madreana (373), Circumboreal (226), o las Regiones Florísticas Atlánticas Norte Americanas (120). Los niveles de endemismo en la flora de la zona alpina de las Southern Rocky Mountains varía de montañas simples (7) a la flora como conjunto (59) que incluye 25 taxa endémicos de las Southern Rockies y su zona alpina. El catálogo está basado en especímenes testigo y puede que sea útil a los botánicos y gestores del territorio para determinar que taxa puede que existan en su área de interés.

INTRODUCTION

Field detection of changes in occurrence, distribution, or abundance of alpine plant species is predicated on knowledge of which species are in specific locations. Baseline surveys for this purpose are anchored in the elucidation of regional species pools; therefore, what species could occur at the chosen baseline survey sites. High quality baseline study design to detect change at local and regional scales also hinges on the synergistic ability of plant systematists, ecologists, and land managers to identify and track individual species as systematic, ecological, and evolutionary entities. Alpine species in their mountaintop habitats have limited opportunity to migrate upslope or northward and may be more vulnerable to local extinction (Chapin & Körner 1994; Grabherr et al. 1994; Theurillat & Guisan 2001). Concerns of biodiversity managers regarding the potential loss of alpine vascular plant species due to global warming often center on possible inadequate rates of species migra-

tion or microevolutionary adaptation. Recent studies have shown or predicted a variety of species responses to increased temperatures and changes in precipitation patterns in montane and alpine zones (e.g., Crimmins et al. 2011; Pauli et al. 2012). In the Southern Rocky Mountains, determination of the regional alpine plant species pool should allow baseline studies to be more effective at detecting real change.

Completion of 4,000–13,000 km^2 scale floristic inventories containing alpine areas by the staff and floristic graduate students from the Rocky Mountain Herbarium (RM) over the past 27 years (Kastning 1990; Vanderhorst 1993; Lyon 1996; Chumley 1998; Moore 1998; Elliott 2000; Taylor 2000; Nunn 2003; Arnett 2002; Holt 2002; Foley 2006; Reif 2006; Flaig 2007; Larson 2008; Legler 2010; Lukas et al. 2012; Brummer 2014; and Kirkpatrick 2014; also Nelson 1974, 1984) presents an opportunity to synthesize species occurrence and distribution information for the entire Southern Rocky Mountain Region. The ongoing efforts of the Flora of North America (FNA 1993+) project to standardize species circumscriptions and nomenclature transcends the more fragmented data contained in state floras such as Weber and Wittmann (2012), Dorn (2001), and Allred and Ivey (2012). The recently completed Intermountain Flora (Cronquist et al. 1972; Cronquist et al. 1977, 1989, 1997, 1994; Cronquist et al. 1984; Holmgren et al. 2005; Holmgren et al. 2012) illustrates what can be achieved on a physiographic scale. There are a few alpine specific checklists for small areas within the Rocky Mountain Cordillera (Little 1941; Johnson & Billings 1962; Spence & Shaw 1981; Rundel et al. 2008) but not for the entire Southern Rocky Mountain Region. The purpose of this study is to document the occurrence of vascular plant species in the alpine zone of the Southern Rockies using voucher specimen information from the two largest regional herbaria: Rocky Mountain Herbarium and University of Colorado Herbarium (COLO). Species distribution within the Southern Rocky Mountain region and by habitat within the alpine zone is a secondary goal. The resulting checklist will serve as a reference for both land managers and researchers when establishing site specific baseline studies to detect changes in plant distribution and occurrence.

Study Area

The Southern Rocky Mountain Region (Arno & Hammerly 1984, Fig. 1) is the southern portion of the proposed boundaries for the Flora of the Rocky Mountains Project (Hartman 1992). It is centered on the mountain ranges of Colorado and extends north to the Medicine Bow Mountains in southeast Wyoming and south into the Sangre de Cristo Range of north central New Mexico. It also includes the La Sal Mountains of Utah (Hartman 1992) and adds the San Francisco Peaks in northern Arizona due to floristic similarities (Little 1941; Schaak 1983). Colorado was divided into four contiguous subregions (Fig. 1) based on state lines (Wyoming and New Mexico) and by major highway corridors (I-25, I-70, US Hwy. 50, and by US Hwy. 285 south of US Hwy. 50). Thus Colorado is separated into north, central, southeast, and southwest geographic components.

Our area of interest is the alpine zone comprised of meadow and treeline ecotone areas of the Southern Rockies as defined by Körner (1998, 2003). Timberline is the local upper elevational limit of closed canopy forest; treeline is the general upper limit of scattered clumps of upright trees greater than three meters in height; treeline ecotone is the transition region between timberline and treeline with a mix of upright trees and herbaceous vegetation; and alpine meadow is the herbaceous plant dominated region above treeline, but often includes dwarf shrubs, scattered single trees, krummholz, and patchily vegetated talus, rock outcrops, and peaks. In the Southern Rockies, the alpine zone starts at 3350 m in southeast Wyoming and gradually rises to begin at 3540 m in northern New Mexico.

Most of the study area is within the Southern Rocky Mountain Province of the Rocky Mountains Physiographic System (Hunt 1974; Brouillet & Whetstone 1993). The predominantly north-south oriented mountain ranges from the southeast Wyoming subregion through the north, central, and southeast Colorado subregions to the northern New Mexico subregion are underlain by weathered granitic formations while the San Juan Mountains in the southwest Colorado subregion are of volcanic origin. Both the Utah and Arizona subregions are within the Colorado Plateau Physiographic Province. The La Sal Mountains are the result of laccolithic intrusions and have exposed igneous rocks above timberline (Baars 1983; Blakey & Ranney 2008). The San Francisco Peaks are the collapsed caldera edge of a stratovolcano (Nations & Stump 1981). Surface topography within the study area is quite variable and rugged due to uplift, erosion, and glaciation, but it also includes

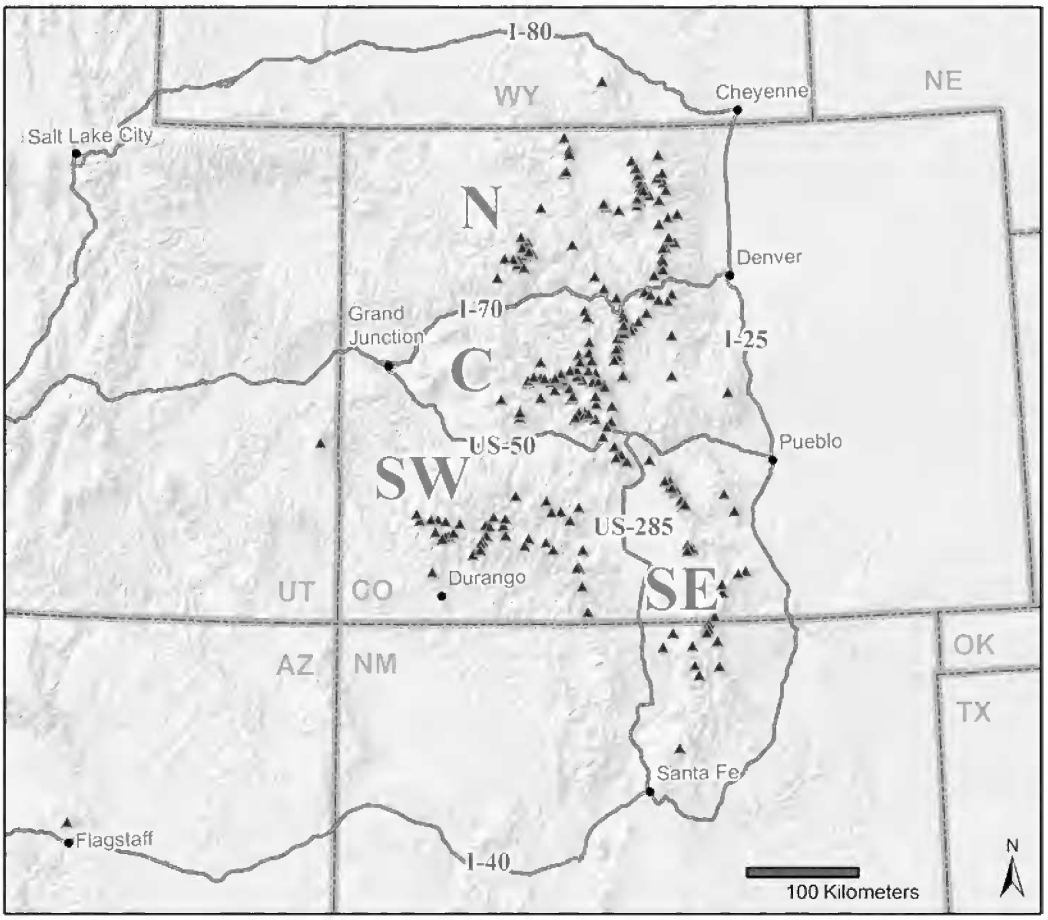

Fig. 1. Study area map for the alpine zone vascular plant flora of the Southern Rocky Mountains. Triangles indicate the 245 collections sites each of which may represent several individual collections at the RM and COLO. The eight sub-regions within the Southern Rockies are by state (AZ, NM, UT, WY) and within Colorado by four sub-regions using highways that follow major physiographic separations. N = northern Colorado mountain ranges, C = central Colorado mountain ranges, SW = San Juan Mountains, SE = southeastern Colorado mountain ranges.

extensive alpine meadows on round topped ridges that have escaped glaciation since before the Wisconsin epoch (Marr 1967).

The climate of the Southern Rockies has two primary periods of precipitation, summer and winter (Arno & Hammerly 1984). Most summer precipitation originates from southern air masses while winter snows enter from the North Pacific (Arno & Hammerly 1984). At Niwot Ridge (3740 m elevation) in northern Colorado, July mean temperature is 8°C (Billings 2000) and summers are cool with frequent thunderstorms, sometimes with hail and sleet, with a short growing season of 45 days (Marr 1967). Winters are long, cold, and windy with frequent blizzards and a minimum temperature of about -28°C at Niwot Ridge (Marr 1967); January mean temperature is -14°C (Billings 2000). Mean annual temperature at Niwot Ridge is -3.8°C; mean annual precipitation ranges from 66-86 cm; and mean annual windspeed is 25 km/hr (Marr 1967).

METHODS

The alpine areas have been systematically inventoried by the staff and floristics graduate students from the RM. This study is largely a synthesis of RM collections verified by Hartman or Nelson over the past few de-

cades, as well as those housed at the University of Colorado (COLO). The area covered is southeast Wyoming, Colorado, north central New Mexico, the La Sal Mountains in southeast Utah, and the San Francisco Peaks in northern Arizona. From the two databases, we chose 245 collection sites. In searching the databases, the term "alpine" was first sought followed by elevation adjusted by latitude. Sites chosen from the RM database were known and collected by at least one of the authors and associated graduate students. From the COLO database, sites were sorted by county and if site elevation was above the known alpine zone and had more than 20 collections, specimen labels were searched for "alpine" and if present, included on the initial species list. This list was extensively vetted for specimens that appeared to be out of geographic or elevational range. Taxonomic and geographic data were pulled from the RM and COLO plant specimen databases. Habitat data was not always available from the specimen record, in which case, habitat assignment was based on the authors' knowledge of the site and the collector. Lists of species from each location were recorded in an expanded spreadsheet.

Systematics and nomenclature follow the published volumes of *Flora of North America* (FNA 1993+) with minor exceptions and follow current taxonomic usage at the RM for families not yet revised by FNA. Exceptions to FNA include recognition of Dorn's treatment for *Salix* (Dorn 2010), *Packera ödes* (Rydb.) W.A. Weber as a segregate of *Packera streptanthifolia*, *Trisetum montanum* Vasey as a segregate of *Trisetum spicatum,* and *Abies arizonica* Merriam as a segregate of *Abies bifolia*. Floristic region classification is based on Thorne's (1993) phytogeography treatment for FNA. Levels of endemism were determined by the authors based on distribution maps published in FNA, from RM and USDA Plants online databases, and from geographic distributions published in the Intermountain Flora (Cronquist et al. 1972; Cronquist et al. 1977, 1989, 1997, 1994; Cronquist et al. 1997; Holmgren et al. 2005; Holmgren et al. 2012) and state floras. The RM database was thoroughly searched (beyond our sites) for putative Southern Rockies and alpine endemics to verify our designations. Disjunct populations of taxa are separated by at least one state or province. Our use of the term "alpine endemic" indicates vascular plant taxa that are distributionally restricted to the alpine zone of the Rocky Mountain Cordillera, unlike Körner (2003) who includes these taxa along with taxa that are distributionally centered in the alpine zone as "alpine taxa." Threatened, Endangered, and Sensitive (TES) species designation were taken from each state's natural heritage/rare plants database.

RESULTS

The alpine meadow, talus, and treeline ecotone flora of the Southern Rocky Mountains includes 609 unique taxa (species, varieties, and subspecies) of vascular plants comprising 581 species (Table 1). The richest families are Asteraceae (104 species), Poaceae (58 species), Cyperaceae (57 species), and Brassicaceae (42 species) (Table 2). The most speciose genera are *Carex* (Cyperaceae, 51 species), *Draba* (Brassicaceae, 23 species), *Erigeron* (Asteraceae, 18 species), and *Poa* (Poaceae, 16 species).

Within the eight subregions of this flora, distribution and frequency of occurrence varies by taxon. Occurrences in Table 2 show subregional distribution and give some indication of relative abundance within each taxon. Between taxa frequency-of-occurrence comparisons may not be valid due to collection biases. Examples range from the widespread and common *Geum rossii* to the infrequent single mountain endemic, *Senecio fremontii* var. *inexpectatus*.

The central Colorado subregion is the most taxon rich at 499. Richness tapers off to the north, southeast, and southwest, dropping to 127 and 211 at the north and south ends of the contiguous Southern Rockies in Wyoming and New Mexico, respectively. The east-west trending Hoosier Ridge in central Colorado, which has been repeatedly surveyed, has 180 taxa alone. The more insular La Sal Mountains of Utah are similar to the north (Wyoming) end with 130 taxa, and the yet more distant San Francisco Peaks of Arizona have only 58 vascular plant taxa in our data set.

Species occurrences between alpine meadow/treeline ecotone areas are also variable. Some species such as *Minuartia obtusiloba, Carex elynoides,* and *Hymenoxys grandiflora* occur mostly in alpine meadows whereas many species occur throughout both areas; for example, *Micranthes rhomboidea* (Table 2). Trees define the treeline ecotone area, but very few herbaceous species occur only there and those few are probable outliers

TABLE 1. Summary of search results for Southern Rocky Mountain vascular plants in alpine and treeline ecotone habitats. The survey includes collections from 245 sites in the USFS, RM, and COLO herbaria databases. Disjunct populations are separated from larger populations by at least one state or province. Threatened, Endangered, and Sensitive (TES) species are officially listed under the Endangered Species Act or by US National Forest Regions.

List by Taxonomic Category		List by special category	
Families	50	Endemic to Southern Rocky Mountains	59
Genera	213	Endemic to Alpine/treeline ecotone habitats	37
Species	581	Endemic to a single mountain range	7
Infraspecies	28	Disjunct population(s)	24
Unique taxa	609	TES species	20
		Exotic to Southern Rocky Mountains	11

from lower elevation habitats. Even the conifers *Abies bifolia* and *Picea engelmannii* occur as single trees above the upper treeline ecotone boundary within alpine meadow, although their main abundance is within the closed forest below timberline. Occurrences shown in Table 2 indicate relative habitat preference within the alpine zone of each subregion.

The non-endemic Southern Rocky Mountain alpine zone taxa occur more frequently elsewhere in the Rocky Mountain Cordillera Floristic Region (515) than in the Madrean (373), Circumboreal (226), or North American Atlantic Floristic Regions (120). Most (21 of 24) of the disjunct taxa in this flora are shared with the Circumboreal Floristic Region and northern part of the Rocky Mountain Cordillera Floristic Region. For example, the Colorado and Utah (Uintah Mountains) populations of *Armeria maritima* ssp. *sibirica* are separated by over 1500 kilometers from its main distribution in the circumboreal and arctic regions.

The levels of endemism within the flora of the alpine zone in the Southern Rocky Mountains (Table 1) range from a single peak or mountain range (7 taxa) to the flora as a whole (59 taxa). Notably 25 taxa are endemic to both the Southern Rockies and to its alpine zone. The alpine zone endemics represent 13 families and 24 genera with *Poa* and *Draba* each having four alpine endemic taxa. Alpine zone endemics also include two Endangered Species Act (ESA) Threatened species: *Packera franciscana* from the San Francisco Peaks of northern Arizona and *Eutrema penlandii* from the Mosquito Range of central Colorado. The latter species is listed as *Eutrema edwardsii* in Table 2 since *E. penlandii* was recently synonymized prior to publication of the Flora of North America. However, the disjunct Colorado population of *E. edwardsii* (from northern British Columbia) is still officially listed as Threatened *E. penlandii* pending further review and analysis. The remaining 18 Sensitive species (Table 1) are listed by individual National Forest Regional Offices (Table 2).

DISCUSSION

This study was intended to provide a species checklist for the entire Southern Rocky Mountain alpine zone along with some indication of subregional distribution. We chose a more conservative approach to species occurrence that leans toward errors of omission rather than errors of commission that might result from misidentified specimens in a database only approach. Finer scale distribution by major mountain range within subregions awaits further biogeographical study.

Scott (1995) indicated 609 alpine plant species for the Middle Rockies, however, Hadley (1987) counted 619 alpine species for the Middle and Southern Rocky Mountain regions combined. Our checklist shows 581 alpine zone species from the Southern Rockies (Table 1). These counts are comparable to Körner's (2003) estimate of 600 alpine species for larger mountain systems based on a known alpine species richness for the entire Swiss Alps of approximately 650 and data showing a 150-550 alpine plant species richness range for many smaller Swiss alpine floras (10-100 km^2). Species richness data from smaller North American alpine floras are also within Körner's observed range: Ruby Range of Colorado (220 species, Hartman & Rottman 1987), Teton Range of Wyoming (260 species, Spence & Shaw 1981), Beartooth Plateau of Montana (210 species, Johnson & Billings 1962), and White Mountains of California (163 species, Rundel et al. 2008). The larger scale estimates from the Rocky Mountains also support Körner's conjecture that smaller mountain range components

TABLE 2. Alpine/treeline vascular plant species list for the Southern Rocky Mountains: southeast Wyoming, Colorado, northern New Mexico, La Sal Mountains of Utah, and San Francisco Peaks of Arizona. Number of occurrences within our data from 245 sites are shown by subregion and habitat. Colorado subregions are Northern (n), Central (c), Southwestern (sw), and Southeastern (se), with number of sites examined in parentheses. A = alpine meadow, talus, and turf above treeline (defined as general line at upper edge of clusters of upright trees > 3 m, excluding more isolated single trees), T = treeline ecotone, region below treeline and above timberline (defined as upper edge of relatively closed canopy forest). Taxa from COLO are indicated with C and not assigned to T or A microhabitats. North American Floristic Regions include: Rocky Mountain Cordillera (R), Circumboreal (C), Madrean (M), and Atlantic (A) with exotic indicating that the taxon is not native to the Southern Rocky Mountains. Level of endemism is shown for Southern Rocky Mountain endemics (SRxE), alpine habitat endemics (AE), and taxa that are disjunct from the Southern Rocky Mountain populations by at least one state or province. Total of 609 unique taxa.

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
FERNS AND FERN ALLIES										
Aspleniaceae										
Asplenium trichomanes-ramosum L.				1C	1C				RCA	
Dryopteridaceae										
Athyrium alpestre (Hoppe) Clairv. var. americanum Butters			1A 1T 1C						RM	
Cystopteris fragilis (L.) Bernh.	1A 11T	11A 1T 4C	15A 3T 5C	4A 2T 5C	3A 3C	1A	1A	3A	RCMA	
Cystopteris reevesiana Lellinger				1A 1C	4A		1A 1T		RM	
Polystichum lonchitis (L.) Roth		2C	1C						RCA	
Woodsia oregana D.C. Eaton var. cathcartiana (B.L. Rob.) C.V. Morton					4A 1T				RMA	
Equisetaceae										
Equisetum arvense L.		1C		1A					RCMA	
Equisetum laevigatum A. Braun					1A 1T				RMA	
Isoëtaceae										
Isoëtes bolanderi Engelm. var. bolanderi				1C					RM	
Lycopodiaceae										
Huperzia haleakalae (Brack.) Holub		1C	1C						RC	disjunct
Lycopodium annotinum L.		2C	2C						RCMA	
Ophioglossaceae										
Botrychium echo W.H. Wagner			1A 1T	1C					RM	
Botrychium hesperium (Maxon & R.T. Clausen) W.H. Wagner & Lellinger			1A 1T						RM	
Botrychium lanceolatum (S.G. Gmel.) Ångstr. var. lanceolatum		2A		1C				1A	RCM	
Botrychium lunaria (L.) Sw.			1A 1C						RCM	
Botrychium minganense Vict.				1C				2A	RCMA	
Pteridaceae										
Cryptogramma acrostichoides R. Br.	1A	4A 2T 1C	1T 2C	1A 1T 1C	3A			3A	RCMA	
Pellaea breweri D.C. Eaton		1A							RM	
Selaginellaceae										
Selaginella densa Rydb.	1A 11T	7A 1C	12A 1T 6C	4A 2T 2C	4A 1C	1A		8A	RA	
Selaginella weatherbiana R.M. Tryon					2A			1A	R	
GYMNOSPERMS										
Cupressaceae										
Juniperus communis L. var. depressa Pursh	1A	3A 2T 1C	2A 3T 2C	3A 3T 1C	2A	1T	1T	3A 1T	RCMA	

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Pinaceae										
Abies arizonica Merriam					1A				RM	
Abies bifolia A. Murray bis	1A	1A 3T 1C	1A 2T 1C		1A	1T			RM	
Picea engelmannii Parry ex Engelm. var. engelmannii	1A	6A 1T 1C	7A 9T 2C	3A 3T	2A	1T	1T	2A	RM	
Picea pungens Engelm.				5A 1T	1A			1A 1T	RM	
Pinus aristata Engelm.			2A 4T 1C	1A	3A		1T	4A 2T	R	SRxE
Pinus contorta Douglas ex Loudon var. latifolia Engelm.			2A 1T	1A					RC	
ANGIOSPERMS										
Adoxaceae										
Adoxa moschatellina L.		1C	2C	1A 6C	3A			1A	RCA	
Sambucus racemosa L. var. microbotrys (Rydb.) Kearney & Peebles			3A 1T 2C	2C	1A	1T			RM	
Amaranthaceae										
Chenopodium atrovirens Rydb.		1C			1A 1C				RM	
Chenopodium capitatum (L.) Ambrosi var. capitatum		1A							RCMA	
Chenopodium pratericola Rydb.					1A				RMA	
Apiaceae										
Angelica grayi (J.M. Coult. & Rose) J.M. Coult. & Rose	1A	7A 1C	22A 5T 12C	13A 3T 4C	10A 1C			4A	R	SRxE
Bupleurum americanum J.M. Coult. & Rose				1C					RC	
Conioselinum scopulorum (A. Gray) J.M. Coult. & Rose			1A	2A					RM	
Cymopterus alpinus A. Gray		10A 1T 3C	23A 1T 12C	1A 1C	7A 3C	1A	1A	1A	RM	
Cymopterus bakeri (J.M. Coult. & Rose) M. E. Jones			1A 3C	10A 3T 5C	22A 3C	1A		8A 2T	R	SRxE-AE
Cymopterus humilis (Raf.) Tidestr. & Kittell[1]			1C						R	SRxE-AE
Cymopterus lemmonii (J.M. Coult. & Rose) Dorn		14A 1T 1C	19A 6T 7C	17A 5T 7C	12A	1A 1T	1A 1T	1A	RM	
Cymopterus longilobus (Rydb.) W.A. Weber					2A	1A		2A 1T	RM	
Ligusticum porteri J.M. Coult. & Rose var. porteri		1T		6A 1T 2C	1A				RM	
Ligusticum tenuifolium S. Watson		1A 2C	3A 2C						R	
Oxypolis fendleri (A. Gray) A. Heller			4A 1T	5A 1T 2C	1T				RM	
Podistera eastwoodiae (J.M. Coult. & Rose) Mathias & Constance		5A 2T 1C	3A 3C	12A 2T 5C	5A	1T		7A 2T	R	SRxE
Asteraceae										
Achillea millefolium L.	1A	14A 2C	30A 6T 6C	6A 1T 4C	5A	1A 1T		7A 3T	RCMA	
Agoseris aurantiaca (Hook.) Greene		7A 1C	8A 1T 2C	6A 4T 1C	8A 1T	1T		4A 1T	RCM	
Agoseris glauca (Pursh) Raf. var. dasycephala (Torr. & A. Gray) Jeps.		8A 3C	15A 3T 4C	3A 1T 3C	2A	1A 1T		1A	RCA	
Agoseris parviflora (Nutt.) D. Dietrich			5A 2T						RM	
Antennaria anaphaloides Rydb.		3A 2C	6A 2T 1C		2A 1C				RM	
Antennaria corymbosa E.E. Nelson		1A	1A 1T	2A 1T					RM	
Antennaria marginata Greene					1A 1T				RM	
Antennaria media Greene	1A	13A 5C	19A 2T 10C	9A 2T 4C	4A 1C			5A 1T	RCM	

TABLE 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Antennaria microphylla Rydb.		1A	3A 1T		3A			2A	RCMA	
Antennaria parvifolia Nutt.				3A	1A			1A	RMA	
Antennaria rosea Greene		3A 2C	17A 5T 4C	7A 3T 1C	7A 2C	1A 1T		6A 1T	RCMA	
Antennaria umbrinella Rydb.		9A 1T	16A 3T 8C	4A 1T 4C	7A 2C	1A 1T		2A 1T	RM	
Arnica angustifolia Vahl ssp. tomentosa (Macoun) G.W. Douglas & G. Ruyle-Douglas			2C						RC	disjunct
Arnica cordifolia Hook.		1A 3C	5A 2T 2C	3A 3T 1C	1A	1T			RCMA	
Arnica gracilis Rydb.		2A							R	
Arnica latifolia Bong.			1C	1A 1C					RC	
Arnica mollis Hook.		8A 1T 2C	9A 3T 7C	5A 1T 3C	1A				RCM	
Arnica parryi A. Gray		2A 1T 1C	7A 4T 1C	1A 1T					RM	
Arnica rydbergii Greene		5A 1T	9A 3T 4C		1A				R	
Artemisia borealis Pall. ssp. borealis		1A 4C	5A 1T 12C	1A 2C	2A 3C				RC	
Artemisia campestris L. ssp. pacifica (Nutt.) H.M. Hall & Clements		1A	6A 1T	9A	8A				RCM	
Artemisia frigida Willd.		1A	2A 1C		1A 1C				RCMA	
Artemisia laciniata Willd. ssp. parryi (A. Gray) W.A. Weber			3A						R	
Artemisia ludoviciana Nutt. var. ludoviciana					7A				RCMA	
Artemisia michauxiana Besser		1T		1C		1A			RM	
Artemisia norvegica Fr. var. saxitalis (Besser) Jeps.		14A 1T 5C	5A 2T 4C		2A				RC	
Artemisia pattersonii A. Gray		3C	1A 4C					4A	R	SRxE-AE
Artemisia scopulorum A. Gray	1A	20A 10C	36A 3T 17C	14A 3T 5C	11A 3C	1A 1T		9A 4T	RM	
Chaenactis douglasii (Hook.) Hook. & Arn. var. alpina A. Gray			14A 2T 11C	5A 1T 1C	3A 1C				RM	
Cirsium clavatum (M. E. Jones) Petr. var. americanum (A. Gray) D.J. Keil		1A							R	
Cirsium eatonii (A. Gray) B.L. Rob. var. eriocephalum (A. Gray) D.J. Keil		3A 1T 2C	12A 14C	2C	9A 2T 2C	1A		3A 1T	R	SRxE
Cirsium parryi (A. Gray) Petr.			1A	2A					RM	
Cirsium scariosum Nutt.		4A	1A						RM	
Crepis nana Richardson		2C	5C			1A			RCM	
Crepis runcinata (E. James) Torr. & A. Gray subsp. runcinata					2A				RMA	
Dieteria bigelovii (A. Gray) D.R. Morgan & R.L. Hartm. var. bigelovii			2C		1A				RM	
Ericameria discoidea (Nutt.) G.L. Nesom			6A 2C		1A				RM	
Erigeron compositus Pursh		8A 2T 2C	14A 1T 8C	8A 1T 4C	3A	1A		1A	RCM	
Erigeron coulteri Porter		1A 1C	7A 4T 1C	3A 1T 4C	1A 1T			3A 1T	RM	
Erigeron elatior (A. Gray) Greene		1C	6A 2T 1C	4A 1C	1A				R	SRxE
Erigeron eximius Greene	1T		2A	1A	1A				RM	
Erigeron formossisimus Greene var. formossisimus			1A		4A				RM	
Erigeron formossisimus Greene var. viscidus (Rydb.) Cronquist			4A	2A		1A			RM	
Erigeron glacialis (Nutt.) A. Nelson var. glacialis	1A	9A 2T 3C	10A 3T 6C	9A 3T 3C	3A 1C	1T		1A 1T	RM	
Erigeron grandiflorus Hook.	1A	16A 1T 7C	35A 5T 20C	13A 2T 6C	14A 2T 3C	1A	1T	7A 2T	RM	

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Erigeron humilis Graham			1C	1C					RC	
Erigeron lanatus Hook.			2C						R	SRxE-AE
Erigeron leiomerus A. Gray		13A	15A 2T 10C	6A 2T 1C	5A 1C				RM	
Erigeron mancus Rydb.[2]						1A			R	SRxE-AE
Erigeron melanocephalus (A. Nelson) A. Nelson	1A	16A 1T 4C	16A 8C	13A 4T 6C	6A 1C	1T		3A 1T	R	SRxE
Erigeron nivalis Nutt.	1A				1A				RC	
Erigeron pinnatisectus (A. Gray) A. Nelson	1A	22A 1T 4C	34A 6T 13C	19A 1T 3C	15A 3C			7A	R	
Erigeron subtrinervis Rydb. ex Porter & Britton			1A		1A 1T				RMA	
Erigeron ursinus D.C. Eaton		3A 1T 1C	7A 2T 4C		1A 1T				RM	
Erigeron vagus Payson			4A 7C	1A 1C	4A	1A			RM	
Erigeron vetensis Rydb.			1A	1A					R	
Helianthella parryi A. Gray					3A			4A 1T	RM	
Helianthella quinquenervis (Hook.) A. Gray		1A	2A 1C			1T			RM	
Heterotheca fulcrata (Greene) Shinners		1A 1T	1A			1A			RM	
Heterotheca pumila (Greene) Semple		1A 1C	15A 4T 5C	1A 1C	3A 1C			2A	R	SRxE
Hieracium triste Willd. ex Spreng.	1A	4A 2C	8A 5T 5C	1A 3C	5A			1A 1T	RC	
Hymenoxys brandegeei (Porter ex A. Gray) K.L. Parker					15A 7C			10A 1T	RM	
Hymenoxys grandiflora (Torr. & A. Gray ex A. Gray) K.L. Parker	1A	26A 8C	49A 4T 17C	20A 3T 5C	3A	1A		1A	R	
Hymenoxys hoopesii (A. Gray) Bierner		1T	2A 2T	8A 1T 1C	2A	1T			RM	
Oreochrysum parryi (A. Gray) Rydb.		3A 2T	3A 1T 1C	2A 1T 1C	1A 1T	1T			RM	
Packera cana (Hook.) W.A. Weber & Á. Löve		4A 1T 1C	12A 7C						RMA	
Packera crocata (Rydb.) W.A. Weber & Á. Löve		3C	6C	2C	1C				RM	
Packera dimorphophylla (Greene) W.A. Weber & Á. Löve var. dimorphophylla	1A	12A 1T 2C	17A 1T 8C	12A 1T 3C	3A				RM	
Packera fendleri (A. Gray) W.A. Weber & Á. Löve			1A 1C	3A 1T	1A				RM	
Packera franciscana (Greene) W.A. Weber and Á. Löve[3]							1A		R	SRxE-AE
Packera öodes (Rydb.) W.A. Weber				2C	1A				R	
Packera porteri (Greene) C. Jeffrey			1A 5C						R	AE
Packera streptanthifolia (Greene) W.A. Weber & Á. Löve		1A 1T	1C	2A	2A 1T			1A	RCM	
Packera tridenticulata (Rydb.) W.A. Weber & Á. Löve		1A	6A 1T	9A 2T	2A 1T				RMA	
Packera werneriifolia (A. Gray) W.A. Weber & Á. Löve		3A 2T 1C	21A 2T 15C	5A 1T 10C	11A 3C			1A	RM	
Pyrrocoma clementis Rydb. var. clementis			3A 1T 2C	2C					RM	
Pyrrocoma uniflora (Hook.) Greene var. uniflora			3A 4C						RM	
Saussurea weberi Hultén			6A 5C		1C				R	AE
Senecio amplectens A. Gray var. amplectens			9A 2T 3C	1A 2C	3A 1T 2C			4A	R	
Senecio amplectens A. Gray var. holmii (Greene) H.D. Harr.		9A 1T 2C	23A 3T 11C	8A 7C	14A 1C			6A 1T	RM	AE
Senecio atratus Greene		2A 1T 1C	10A 2T 3C	6A 1T 1C	8A 1T 1C	1A			RM	
Senecio bigelovii A. Gray var. hallii A. Gray			2A 1T	4A 2C	4A 1T 1C			1A 1T	RM	
Senecio crassulus A. Gray	1A	13A 1T 2C	24A 9T 5C	6A 1T 7C	2A	1A 1T		3A 1T	RM	

TABLE 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Senecio fremontii Torr. & A. Gray var. blitoides (Greene) Cronquist	1A	15A 1T 3C	22A 1T 12C	7A 2T 2C	8A 3C			4A 2T	R	SRxE
Senecio fremontii Torr. & A. Gray var. inexpectatus Cronquist[2]						1A			R	SRxE-AE
Senecio integerrimus Nutt. var. exaltatus (Nutt.) Cronquist			5A 1C						RM	
Senecio pudicus Greene			3A 1T		1C				RM	
Senecio soldanella A. Gray		3A	6A 8C	5A 1T 3C	5A			3A	R	SRxE
Senecio taraxacoides (A. Gray) Greene		3A 3C	2A 6C	1A	14A 4C			7A 2T	R	SRxE-AE
Senecio triangularis Hook.		3A 1C	7A 3T 1C	2A 2C	1A 1T				RCM	
Senecio wootonii Greene			1A 1T	1A			1A		RM	
Solidago multiradiata Aiton	1A	6A	2A 1T 1C	2A 1T 2C		1A 1T	1A 1T	1A	RCM	
Solidago nana Nutt.		1A	3A 1T		2A				RM	
Solidago simplex Kunth var. simplex	1A	13A 1T 3C	25A 1T 7C	2A 1T 2C	8A 1T 3C			9A 2T	RCMA	
Symphyotrichum foliaceum (Lindl. ex DC.) G.L. Nesom var. apricum (A. Gray) G.L. Nesom	1A	5A 1C	5A	1C					RM	
Symphyotrichum foliaceum (Lindl. ex DC.) G.L. Nesom var. parryi (D.C. Eaton) G.L. Nesom			2A 1T 1C	2A					RM	
Taraxacum ceratophorum (Ledeb.) DC.		2C	7A 9C	2C	6A 1T 1C			3A	RCM	
Taraxacum officinale Weber ex F.H. Wigg.		1A	12A 1T	3A 3C	1A 1T	1A 1T	1T	1A	exotic	
Taraxacum scopulorum (A. Gray) Rydb.	1A	2C	4A 7C	1A 1T 2C	1A 1T 1C			2A	RC	disjunct
Tetraneuris acaulis (Pursh) Greene var. caespitosa A. Nelson		5C	6A 1T 8C		10A 1T 4C			8A 1T	R	
Tonestus lyallii (A. Gray) A. Nelson		5A 2C	2C						R	
Tonestus pygmaeus (Torr. & A. Gray) A. Nelson	1A	14A 2C	25A 1T 17C	11A 5C	15A 2T 2C			9A 3T	R	
Townsendia eximia A. Gray					1A				RM	
Townsendia leptotes (A. Gray) Osterh.			4C						RM	
Townsendia rothrockii A. Gray ex Rothr.			3A 5C	1A 2C					R	SRxE
Tripleurospermum inodorum (L.) Sch. Bip.					1A				exotic	
Xanthisma coloradoense (A. Gray) D.R. Morgan & R.L. Hartm.[1]			1T 2C	2A 2C					R	SRxE
Betulaceae										
Betula glandulosa Michx.		1A 2C	4A						RC	
Boraginaceae										
Eritrichium nanum (Vill.) Schrad. ex Gaudin var. elongatum (Rydb.) Cronquist		1T	6A 4C	22A 19C	12A 1C	12A 2T 5C			8A	RC
Hydrophyllum fendleri (A. Gray) A. Heller var. fendleri					2A 1T				R	
Lithospermum ruderale Douglas ex Lehm.		1A							RM	
Mertensia alpina (Torr.) G. Don		1A	1A 1C	1A	1A 1C			2A	R	
Mertensia ciliata (E. James ex Torr.) G. Don var. ciliata	1T	4A 2T 1C	11A 3T 6C	6A 3T 5C	1A 1T	1T			RM	
Mertensia franciscana A. Heller			4A 3C	1A			1A 1T		RM	
Mertensia fusiformis Greene			1A	3A 1T					RM	
Mertensia oblongifolia (Nutt.) G. Don	1A	1A	3A 1T 4C	11A 1T 4C	4A				RM	
Mertensia viridis (A. Nelson) A. Nelson[4]	1A 11T	20A 1T 5C	35A 2T 23C	12A 2T 2C	21A 4C	1A		4A 1T	RM	

TABLE 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Myosotis alpestris F.W. Schmidt		11A 1T							RC	
Phacelia bakeri (Brand) J.F. Macbr.					3A 1C			4A	R	
Phacelia glandulifera Piper			1A						RM	
Phacelia glandulosa Nutt. var. glandulosa				1A					RM	
Phacelia hastata Douglas ex Lehm. var. hastata			5A 1T 1C		1A				RM	
Phacelia sericea (Graham ex Hook.) A. Gray var. ciliosa Rydb.		1A	9A 2T						RM	
Phacelia sericea (Graham ex Hook.) A. Gray var. sericea		14A 1T 2C	22A 2T 15C	19A 5T 3C	11A	1A		3A	R	
Brassicaceae										
Boechera drepanoloba (Greene) Windham & Al-Shehbaz			1A						R	
Boechera grahamii (Lehm.) Windham & Al-Shehbaz		1A	1A	1A 1T					RCA	
Boechera languida (Rollins) Windham & Al-Shehbaz			1A						R	
Boechera lemmonii (S. Watson) W.A. Weber			5A 5C	1A 2C					RM	
Boechera spatifolia (Rydb.) Windham & Al-Shehbaz		1A		1A					R	
Boechera stricta (Graham) Al-Shehbaz		6A 1T 2C	20A 9T 2C	8A 2T 3C	3A 1T 1C	1A 1T		1A 1T	RCMA	
Braya glabella Richardson subsp. glabella[1]			2C						RC	
Braya humilis (C. A. Mey.) B.L. Rob.			4C						RC	
Cardamine cordifolia A. Gray		3A 1T 2C	8A 1T 2C	7A 1T 2C	2A	1T			RM	
Cardamine oligosperma Nutt. var. oligosperma		1A							RM	
Descurainia incana Bernh. ex Fisch. & C.A. Mey.		1A	1A 1C	1A					RCMA	
Draba abajoensis Windham & Al-Shehbaz[2]						1T			RM	
Draba albertina Greene			1C	1A 1C					RCM	
Draba aurea Vahl ex Hornem.	1A	7A 3C	23A 3T 15C	9A 2T 5C	17A 1T 3C	1A	1A 1T	3A	RCMA	
Draba cana Rydb.	1A	4A 3C	7A 11C	1A 1T 1C	4A			3A	RCMA	
Draba crassa Rydb.		2A 2C	19A 14C	2A 4C	2A				R	
Draba crassifolia Graham	1A	5A 1T 4C	12A 3T 12C	13A 4T 3C	5A 2C	1A		3A	RCM	
Draba densifolia Nutt.	1A								RM	
Draba exunguiculata (O.E. Schulz) C.L. Hitchc.[1]			1A 5C						R	SRxE-AE
Draba fladnizensis Wulf.		2A 1C	8A 4C	1A 1C	10A 1C	1A			RC	disjunct
Draba globosa Payson			2C						RM	
Draba graminea Greene				4A 2C					R	SRxE-AE
Draba grayana (Rydb.) C.L. Hitchc.[1]		1A 2C	6A 5C		4A 3C			2A	R	SRxE-AE
Draba heilii Al-Shehbaz[5]								1A	R	SRxE-AE
Draba helleriana Greene				1A	1A			4A 1T	RM	
Draba incerta Payson			2A 1C						RCM	
Draba lonchocarpa Rydb.		3C	7A 18C						RCM	
Draba malpighiacea Windham & Al-Shehbaz				1C					R	SRxE
Draba oligosperma Hook.	1T		5A 2T 9C						RCM	
Draba porsildii G.A. Mulligan		1A 3C	2A 4C		2A				RC	

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Draba smithii Gilg ex O.E. Schulz[1]				2A	1C				R	SRxE
Draba spectabilis Greene			6A 1T 2C	6A 3T 4C					R	
Draba streptobrachia R.A. Price			1A 5C	7A 1T 5C	4A 1C			1A	R	SRxE
Draba streptocarpa A. Gray		4A 7C	4A 3C	1A	8A 1T 1C			6A	R	
Draba ventosa A. Gray			2A 3C						R	
Erysimum capitatum (Douglas ex Hook.) Greene var. purshii (T. Durand) Rollins	1A	10A 1T 2C	23A 3T 18C	21A 3T 4C	16A			6A 1T	RCM	
Eutrema edwardsii R. Br.[3]			1A 5C						RC	disjunct
Noccaea fendleri (A. Gray) Holub ssp. glauca (A. Nelson) Al-Shehbaz and M. Koch	1A 11T	11A 1T 3C	27A 10T 11C	15A 6T 3C	21A 1C	1A 1T	1A	1A 1T	RM	
Physaria alpina Rollins			5A 1T 8C						R	SRxE-AE
Rorippa alpina (S. Watson) Rydb.		1A 1C	3A 1T 3C	1C					RM	
Rorippa curvipes Greene			1C	1A 1T 1C					RMA	
Smelowskia americana Rydb.		11A 1T 2C	34A 2T 16C	15A 1T 4C		1A			RM	
Campanulaceae										
Campanula parryi A. Gray var. parryi		1A	4A		1A				RM	
Campanula rotundifolia L.	1A	10A 1T 2C	16A 5T 9C	1A 3C	6A 1C			4A 1T	RCMA	
Campanula uniflora L.	1A	3A 6C	9A 13C	2A 2C	4A 1T 4C			2A	RC	
Caprifoliaceae										
Linnaea borealis L. var. longiflora Torr.			1C						RCMA	
Lonicera involucrata (Richardson) Banks ex Spreng. var. involucrata			2A 2T	1A 1T 3C	1A	1T			RMA	
Valeriana acutiloba Rydb. var. acutiloba		1C	9A 3T 11C	3A 1T	3A 2C				R	SRxE
Valeriana acutiloba Rydb. var. pubicarpa (Rydb.) Cronquist		4A 2T	1A 1T						RM	
Valeriana edulis Nutt. ex Torr. & A. Gray var. edulis		4A 1T 1C	10A 4T 1C	5A 1T 1C	5A 1C			1A 1T	RM	
Valeriana occidentalis A. Heller		1A 1C	1A	7A 3T	3A 1T				RM	
Caryophyllaceae										
Arenaria lanuginosa (Michx.) Rohrb. var. saxosa (A. Gray) Zarucchi, R.L. Hartm. & Rabeler			1C	2C			1T		RM	
Cerastium arvense L. ssp. strictum Gaudin	1A	12A 3C	26A 5T 8C	6A 2T	9A 1T 1C	1A 1T		5A 2T	RCMA	
Cerastium beeringianum Cham. & Schltdl.		8A 1C	16A 2T 12C	16A 3T 6C	13A 1T	1A 1T	1A 1T	4A	RCM	
Eremogone congesta (Nutt.) Ikonn. var. congesta		1A	13A 5T 2C						RM	
Eremogone fendleri (A. Gray) Ikonn.		19A 2T 3C	20A 1T 9C	8A 1T 4C	19A 1T 1C	1A 1T	1A	7A 3T	RM	
Eremogone kingii (S. Watson) Ikonn. var. glabrescens (S. Watson) Dorn						1A			RM	
Minuartia macrantha (Rydb.) House		1A	5A 1T 4C	3A 2T 6C			1A		RM	
Minuartia obtusiloba (Rydb.) House	1A	26A 1T 9C	36A 4T 16C	21A 3T 5C	24A 1T 4C	1A	1A	7A 2T	RCM	
Minuartia rubella (Wahlenb.) Hiern	1A	9A 2C	5A 1T 8C	2A 2C	9A 2C	1A	1A 1T	4A	RCM	
Minuartia stricta (Swartz) Hiern		1C	1A 5C	1C	1A				RC	disjunct
Paronychia pulvinata A. Gray	1A 11T	9A 3C	6A 11C	1A	3A 1C			6A	R	

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Sagina caespitosa (J. Vahl) Lange ex Rink		4C	4C						RC	disjunct
Sagina saginoides (L.) H. Karst.		1C	1A 3C	1C		1T			RCM	
Silene acaulis (L.) Jacq.	1A 11T	25A 6C	42A 4T 16C	18A 4T 6C	19A 2C	1A	1A 1T	7A	RCM	
Silene drummondii Hook. var. drummondii		1A 1C	4A 1T 3C	2C	1A 1C				RMA	
Silene drummondii Hook. var. striata (Rydb.) Bocq.		7A	11A 3T	4A 4T	5A	1T			RM	
Silene hitchguirei Bocq.	1A	1A 3C	4A 10C		3A				R	AE
Silene kingii (S. Watson) Bocq.			1A						R	AE
Silene scouleri Hook. ssp. hallii (S. Watson) C.L. Hitchc. & Maguire		1A 2C	1A 6C						R	
Silene uralensis (Rupr.) Bocq. ssp. uralensis			1A 4C	2C					RC	
Stellaria calycantha (Ledeb.) Bong.			1A						RCM	
Stellaria irrigua Bunge			3C	3A 1T 6C	8A			4A	R	disjunct
Stellaria longipes Goldie ssp. longipes	1A	5A 3C	10A 1T 5C	4A 2C	6A 1T 1C	1A		1A 1T	RCMA	
Stellaria umbellata Turcz.		5A 4C	3A 1T 8C	3A 5C	8A			4A	RCM	
Crassulaceae										
Rhodiola integrifolia Raf. var. integrifolia	1A	6A 2C	38A 5T 8C	16A 3T 7C	22A			7A 2T	RCM	
Rhodiola rhodantha (A. Gray) H. Jacobsen	1A	11A 4C	18A 2T 4C	6A 2T 6C	3A 1T 2C		1A 1T	3A	RM	
Sedum lanceolatum Torr. var. lanceolatum	1A	12A 1T 3C	19A 4T 3C	3A 3C	8A	1A		7A 2T	RCMA	
Cyperaceae										
Carex albonigra Mack.	1A 11T	8A 7C	15A 2T 12C	14A 2T	10A 1T 2C	1A	1A 1T	4A	RCM	
Carex aquatilis Wahlenb. var. aquatilis		1C	5A 8C	6A 3T 1C					RCMA	
Carex arapahoensis Clokey		5C	2A 11C	1A 1C	1A 1T 2C	1A			R	
Carex atrosquama Mack.			1C	6A 1T 2C					RC	
Carex aurea Nutt.			1A 1C						RCMA	
Carex bella L.H. Bailey			1C	2A 3C	3A 1T 1C		1T		RM	
Carex brunnescens (Pers.) Poir. var. brunnescens		1A							RCM	
Carex canescens L. var. canescens			2A	1C					RCMA	
Carex capillaris L.		4C	3A 7C					2A	RCMA	
Carex capitata L.		1C	1A	1C					RC	disjunct
Carex chalciolepis T. Holm	1A	18A 1T 7C	23A 1T 22C	11A 3T 6C	10A 1T 5C	1A	1T	9A 1T	RM	
Carex ebenea Rydb.		6A 1T 4C	12A 3T 12C	9A 3T 7C	2A 2C		1A 1T	7A 1T	RM	
Carex elynoides T. Holm	1A	5A 6C	12A 2T 22C	17A 4T 3C	12A 3C	1A		7A	RM	
Carex engelmannii L.H. Bailey			3C						RM	
Carex epapillosa Mack.		1A 1C	5A 1T		3A				RM	
Carex fuliginosa Schkuhr		4C	8C	1C					RC	
Carex geyeri Boott			1C			1T			RM	
Carex gynocrates Wormsk. ex Drejer			1C						RCA	
Carex haydeniana Olney		2A 1T 4C	8A 10C	3A 2T 3C	2A			1A	RM	
Carex illota L.H. Bailey		2A 7C	1A 1T 6C	1A 2C					RM	

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Carex incurviformis Mack.		2C	2A 6C						RC	
Carex jonesii L.H. Bailey			1C						RM	
Carex lachenalii Schkuhr	1A	5C	2A 4C	3C					RC	
Carex macloviana d'Urv.		1C	1A 1C						RC	
Carex magellanica Lam. subsp. irrigua (Wahlenb.) Britton, Sterns & Poggenb.				1C					RCA	
Carex microglochin Wahlenb. subsp. microglochin		2C	3C						RC	disjunct
Carex micropoda C.A. Mey.	1A 11T	11A 8C	7A 1T 9C	3A 4C	1A				RC	
Carex microptera Mack.	1A		2A 1T 1C	1A 1T				1A	RCM	
Carex nardina Fr.		1A 1C	5A 9C	1A 1C	3A			1A	RCM	
Carex nelsonii Mack.		4C	7A 10C	3A 1T 4C	1A 1C			2A	R	
Carex nigricans C.A. Mey.		4A 6C	3A 11C	1A 1T 6C	2A 1C				RC	
Carex nova L.H. Bailey	1A	1A 4C	6A 1T 5C	2A 3C	1A 2C	1A 1T		1A	RM	
Carex obtusata Lilj.		1C	2C	1C	1A 1C				RCA	
Carex pachystachya Cham. ex Steud.			1A 1C		1C				RCM	
Carex pelocarpa F.J. Herm.		1A 1C	1A 3C	3A 1T 1C	1A				RM	
Carex perglobosa Mack.		1A 5C	5A 13C	3A 1T 4C	1C				R	SRxE-AE
Carex petasata Dewey	1A								RCM	
Carex phaeocephala Piper	1A 11T	13A 3C	10A 2T 7C	4C	5A 1C	1A		4A	RM	
Carex pityophila Mack.								1A	RM	
Carex praticola Rydb.		1C	2A 1T						RCA	
Carex praeceptorum Mack.	1A 11T	1C	2C						RM	
Carex rossii Boott		2C	4C	1A 1T	1C	1A 1T			RCMA	
Carex rupestris All.	1A	4C	4A 15C		1A 2C			6A 1T	RC	
Carex saxatilis L.		3C	5C	4C					RC	
Carex scirpoidea Michx. var. pseudoscirpoidea (Rydb.) Cronquist			1A 3C	6C		1A 1T			RM	
Carex scopulorum T. Holm	1A	7A 2T 7C	9A 13C	1A 1T 1C	2A			2A	RM	
Carex siccata Dewey		1A 4C	8A 4T 7C		3A 1T 1C		1T	2A 1T	RCMA	
Carex stenoptila F. J. Herm.					2A 1T				R	
Carex stevenii (T. Holm) Kalela	1A	1A 2C	3C	1A					R	
Carex utriculata Boott		1T		3A 2C					RCMA	
Carex vernacula L.H. Bailey		6C	2C	1A 5C					R	
Eleocharis quinqueflora (Hartm.) O. Schwarz		3C	3C						RCMA	
Eriophorum angustifolium Honck. subsp. angustifolium			1A 2C						RCA	
Eriophorum scheuchzeri Hoppe			1A 1C	4C				2A	RC	
Kobresia myosuroides (Vill.) Fiori & Paoli		4C	6A 12C	2C	3A 5C			3A	RC	
Kobresia sibirica (Turcz. ex Ledeb.) Boeck.		1A 2C	2A 6C						RC	disjunct
Kobresia simpliciuscula (Wahlenb.) Mack.		3C	1A 4C						RC	

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Ericaceae										
Arctostaphylos uva-ursi (L.) Spreng.	1T		3A 2T						RCMA	
Gaultheria humifusa (Graham) Rydb.		2A 2C		2C					R	
Kalmia microphylla (Hook.) A. Heller	1A 11T	4A 1T 4C	1C						RCM	
Moneses uniflora (L.) A. Gray			1C	1A 1T	1A 1T				RCMA	
Vaccinium cespitosum Michx.	1A	1A 1T 2C	2A 3T 1C	5A 2T 4C		1T			RCA	
Vaccinium myrtillus L.		2C	3A 1T 1C	2A 1T 4C	3A				RM	
Vaccinium scoparium Leiberg ex Coville	1A 11T	3A	2C		2A 1T			2A	RM	
Fabaceae										
Astragalus alpinus L. var. alpinus			6A 3C		1A 1T 2C				RCM	
Astragalus australis (L.) Lam. var. glabriusculus (Hook.) Isely			2C						RCMA	
Astragalus molybdenus Barneby[1]			3A 10C						R	SRxE-AE
Astragalus robbinsii (Oakes) A. Gray var. minor (Hook.) Barneby			5C						RC	
Hedysarum occidentale Greene			1C	1A 1C					RM	
Lupinus argenteus Pursh var. argenteus			2A						RM	
Lupinus argenteus Pursh var. laxiflorus (Douglas ex Lindl.) Dorn			5A						R	
Lupinus argenteus Pursh var. rubricaulis (Greene) S. L. Welsh			2A						RM	
Lupinus lepidus Douglas ex Lindl. var. utahensis (S. Watson) C.L. Hitchc.			1A						RM	
Oxytropis borealis DC. var. viscida (Nutt.) S.L. Welsh			2A 3C						RM	
Oxytropis campestris (L.) DC. var. cusickii (Greenm.) Barneby			1C						RM	
Oxytropis campestris (L.) DC. var. spicata Hook.					1A 1T 1C				RCA	
Oxytropis deflexa (Pall.) DC. var. deflexa			4A 6C	1C					RC	
Oxytropis deflexa (Pall.) DC. var. foliolosa (Hook.) Barneby			1A						RCM	
Oxytropis deflexa (Pall.) DC. var. sericea Torr. & A. Gray				1A					RCMA	
Oxytropis lambertii Pursh var. bigelovii A. Gray			1A						RMA	
Oxytropis parryi A. Gray		1A	1C		1A 1T 1C				RM	
Oxytropis podocarpa A. Gray			7A 9C	1C	1C				RC	disjunct
Oxytropis sericea Nutt. var. sericea			1A						RMA	
Oxytropis splendens Douglas ex Hook.			4A 1C		1A				RCA	
Trifolium attenuatum Greene			1C	11A 1T 6C	10A 5C			9A 1T	R	SRxE
Trifolium brandegeei S. Watson				2A 1T 2C				1A 1T	R	SRxE
Trifolium dasyphyllum Torr. & A. Gray	1A 11T	18A 2T 10C	33A 6T 14C	4A 1T 1C	14A 1T 2C	1A 1T		1A	R	
Trifolium nanum Torr.		7A 6C	18A 14C	13A 2T 3C	18A 1T 4C	1A		8A 1T	R	AE
Trifolium parryi A. Gray var. parryi	1A	13A 2T 5C	19A 3T 15C	10A 2T 4C	9A 1T 3C	1T		3A	R	
Trifolium repens L.				2A	1A				exotic	
Gentianaceae										
Frasera speciosa Douglas ex Griseb.		1A 1C	4A 1T 3C	1A	1A				RM	
Gentiana algida Pall.	1A	10A 4C	21A 1T 13C	2A 3C	5A 1T 2C			5A 1T	RC	disjunct

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Gentiana bigelovii A. Gray								1A	RM	
Gentiana parryi A. Gray		5A 1T 5C	12A 2T 7C	2A 2C		1A		2A 1T	RM	
Gentiana prostrata Haenke		1A 3C	6A 10C	2A 5C	1A 3C			2A	RCM	
Gentianella amarella (L.) Boerner var. acuta (Michx.) Herder	1A	6A 6C	7A 9C	1A	5A 1T 2C		1T	2A	RCMA	
Gentianella amarella (L.) Boerner var. heterosepala (Engelm.) Dorn			6A 1T			1A			RM	
Gentianella tenella (Rottb.) Boerner		1C	2A 4C	3C				2A	RCM	
Gentianopsis barbellata (Engelm.) H.H. Iltis		2A 1C	4A 1T 2C	1C	1C			1A	RM	
Gentianopsis detonsa (Rottb.) Ma var. elegans (A. Nelson) N.H. Holmgren		1C	6A 2T 2C	2A 4C	1A				RM	
Swertia perennis L.		5A 1T 3C	9A 1T 7C	3A 2C	1A 2C				RM	
Geraniaceae										
Geranium richardsonii Fisch. & Trautv.		1C	2A 2T 1C	7A 2T					RM	
Grossulariaceae										
Ribes cereum Douglas var. cereum		1A 2T	4A 1T	3A 1T					RMA	
Ribes inerme Rydb. var. inerme			1A						RM	
Ribes lacustre (Pers.) Poir.	1A	1A							RCMA	
Ribes montigenum McClatchie	1A	3A 2T 1C	8A 9T 9C	10A 5T 3C	6A	1A 1T	1A 1T	3A	RM	
Ribes wolfii Rothr.			1A 1T 1C	2A 2T 1C				1A	RM	
Hydrangeaceae										
Jamesia americana Torr. & A. Gray var. americana			1A						RM	
Juncaceae										
Juncus arcticus Willd. var. balticus (Willd.) Trautv.			1A 1C						RCMA	
Juncus biglumis L.		3C	4C					2A	RC	disjunct
Juncus castaneus Sm.		4C	2A 3C		1C			3A	RC	
Juncus drummondii E. Mey.	1A	9A 1T 4C	20A 1T 13C	12A 6T 4C	2A 1C	1T		3A 1T	RM	
Juncus hallii Engelm.			1A						RM	
Juncus mertensianus Bong.		1A 2C	4A 1T 5C	3A 2T 4C	1C	1T			RM	
Juncus parryi Engelm.	1T	5A 2C	6A 3C	2A	2A			2A	RM	
Juncus triglumis L. var. albescens Lange			1A 5C					2A	RC	
Juncus triglumis L. var. triglumis		7C	1A 3C					1A	RC	disjunct
Luzula parviflora (Ehrh.) Desv.		1T 1C	4A 2T 1C	1A 1C	1A	1T		1A	RCM	
Luzula spicata (L.) DC.	1A	12A 6C	29A 5T 16C	12A 3T 4C	15A 1C	1A		11A 3T	RCM	
Luzula subcapitata (Rydb.) H.D. Harr.		2C	3A 7C	2C					R	SRxE
Liliaceae										
Allium cernuum Roth			1A						RMA	
Allium geyeri S. Watson var. geyeri		4C	1A 1T 2C	7A 3T 4C	8A	1T		2A 1T	RM	
Allium geyeri S. Watson var. tenerum M.E. Jones				3A					R	
Calochortus gunnisonii S. Watson var. gunnisonii					1A				RM	
Erythronium grandiflorum Pursh var. grandiflorum	1A 11T	1C	2C	1C					RM	

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Lloydia serotina (L.) Rchb. var. serotina		1A 6C	18A 19C	9A 3T 5C	11A 1C			6A	RC	
Maianthemum racemosum (L.) Link var. amplexicaule (Nutt.) Dorn					1A				RM	
Veratrum californicum T. Durand				4A 2T 3C	1T				RM	
Zigadenus elegans Pursh		5A 2T 1C	18A 3T 6C	9A 2T 3C	12A 2C	1A 1T		4A 1T	RCMA	
Linaceae										
Linum lewisii Pursh var. lewisii			2A						RCMA	
Onagraceae										
Chamerion angustifolium (L.) Holub var. canescens (A.W. Wood) N.H. Holmgren & P.K. Holmgren		5A 1T 1C	8A 2T 3C	3A 1T 1C	1A			2A	RCMA	
Chamerion latifolium (L.) Holub		1A	5A 2C	1A 4C					RCM	
Epilobium anagallidifolium Lam.		4A 3C	3A 5C	7A 3C	1A				RCM	
Epilobium clavatum Trel.		4A 1C	2A 2C		1A				RM	
Epilobium halleanum Hausskn.		1A 1C	1A 1T						RM	
Epilobium hornemannii Rchb. var. hornemannii		3A 2C	3A 2C	1A 1C					RCM	
Epilobium saximontanum Hausskn.		1T 1C		2C	1T				RCM	
Oenothera cespitosa Nutt. var. macroglottis (Rydb.) Cronquist					1A				R	
Orchidaceae										
Platanthera aquilonis Sheviak			2A						RCA	
Platanthera stricta Lindl.					1T				R	
Papaveraceae										
Papaver radicatum Rottb. ssp. kluanensis (D. Löve) D.F. Murray		1A 3C	5A 13C	1A 2C	1A				R	AE
Parnassiaceae										
Parnassia fimbriata König var. fimbriata			2A 1C	1C					RCM	
Parnassia kotzebuei Cham. ex Spreng.[1]		2C	2C	1C					RC	
Plantaginaceae										
Plantago tweedyi A. Gray				2A 2T		1T			RM	
Plumbaginaceae										
Armeria maritima (Mill.) Willd. ssp. sibirica (Turcz. ex Boiss.) G.H.M. Lawr.[1]			1A 1C						RC	disjunct
Poaceae										
Achnatherum lettermanii (Vasey) Barkworth		5A 1T	1C	1A		1T			RM	
Achnatherum nelsonii (Scribn.) Barkworth ssp. dorei (Barkworth & J. Maze) Barkworth		1C	1A						RMA	
Agrostis mertensii Trin.	1A	2C	2A 3C	1C			1T		RCA	
Agrostis scabra Willd.	1A		2A 2T 1C	1C 1T 1C	1A 1C			1A 1T	RCMA	
Agrostis variabilis Rydb.	1A	1A 4C	1C	1A				3A	RM	
Alopecurus magellenicus Lam.		1C	4A						RC	
Alopecurus pratensis L.				2A					exotic	
Anthoxanthum hirtum (Schrank) Y. Schouten & Veldkamp			3C						RCMA	

TABLE 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Avenula hookeri (Scribn.) Holub			4C						RA	
Blepharoneuron tricholepis (Torr.) Nash					2A			2A	RMA	
Bromus ciliatus L.		1C			1C		1T		RCMA	
Bromus inermis Leyss.			1A						exotic	
Bromus porteri (J.M. Coult.) Nash			1A 1T		1T				RMA	
Bromus pumpellianus Scribn.			2A 1T 1C		1A 1C				RCA	
Calamagrostis canadensis (Michx.) P. Beauv.		1A 1T 2C	2A	2A 1T 1C	1C			1A	RCMA	
Calamagrostis purpurascens R. Br.	1A	4A 1T 4C	13A 8C	1C	4A 3C	1A		5A 1T	RCM	
Calamagrostis stricta (Timm) Koeler						1T			RCMA	
Danthonia intermedia Vasey		1A 1C	2A 1T 3C	1A	1A 1C		1T	2A 1T	RCM	
Danthonia parryi Scribn.			1C		1C			2A	RM	
Deschampsia cespitosa (L.) P. Beauv. var. cespitosa[6]	1A	14A 1T 4C	22A 3T 9C	11A 4T 4C	6A 1T 3C			7A 2T	RCMA	
Elymus bakeri (E.E. Nelson) Á. Löve				1A 1T				1A	RM	
Elymus scribneri (Vasey) M.E. Jones	1A	10A 1T 5C	26A 3T 11C	11A 1T 4C	17A 1T 4C	1A	1A	9A 2T	RM	
Elymus trachycaulus (Link) Gould ex Shinners ssp. trachycaulus		9A 1T 1C	17A 4T 8C	5A 1T 3C	2A 3T 2C	1A		1A	RCMA	
Elymus violaceus (Hornem.) Freilberg								5A	RCM	
Festuca baffinensis Polunin		1A 1C	3C						RC	
Festuca brachyphylla Schult. ex Schult. & Schult. f. var. coloradensis (Fred.) Dorn	1A 11T	8A 1T 2C	25A 3T 12C	10A 2T 5C	12A 1T 2C	1A	1A 1T	10A 2T	R	
Festuca earlei Rydb.		1A 1C	1A 1C						RM	
Festuca idahoensis Elmer			2A 4C	1C					RM	
Festuca minutiflora Rydb.	1A	4A 5C	10A 3T 4C	8A 1T 2C	7A			3A 1T	RM	AE
Festuca rubra L. ssp. rubra		2C	1A						exotic	
Festuca saximontana Rydb. var. purpusiana (St.-Yves) Fred. & Pavlick		1A	1A 1C	4A 1T 1C	3A				R	
Festuca saximontana Rydb. var. saximontana		4A 3C	4A 1T 5C	2A 1C	2A 3C			3A	RCMA	
Festuca thurberi Vasey			3T 3C	7A 2T 2C	2A 1C			2A	RM	
Helictotrichon mortonianum (Scribn.) Henard		2C	8A 10C		2A			1A	R	
Koeleria macrantha (Ledeb.) Schult.			1A						RCMA	
Phippsia algida (Phipps) R. Br.		1C	6C						RC	disjunct
Phleum alpinum L. var. alpinum	1A	8A 1T 4C	14A 3T 8C	15A 6T 4C	8A 1T 1C	1A	1A 1T	7A 1T	RCM	
Poa abbreviata R. Br. ssp. pattersonii (Vasey) Á. Löve, D. Löve, & B.M. Kapoor	1A	4A 3C	12A 6C	9A 1T	5A	1A			RC	AE
Poa alpina L. var. alpina	1A	8A 1T 4C	20A 3T 8C	15A 3T 6C	8A 1T 1C			3A	RCM	
Poa annua L.			1A						exotic	
Poa arctica R. Br. ssp. aperta (Scribn. & Merr.) Soreng			1A					1A	RM	
Poa arctica R. Br. ssp. arctica	1A	3A	5A	1A	1A				RC	
Poa arctica R. Br. ssp. grayana (Vasey) Á. Löve, D. Löve, & K.M. Kapoor	1A	3A 4C	18A 5T 11C	3A 3C	4A 1C			5A	R	AE
Poa arida Vasey			3A 1T	1A 1T	3A			1A	RA	
Poa cusickii Vasey subsp. pallida Soreng		3A		6A					RCM	

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Poa cusickii Vasey var. epilis (Scribn.) C.L. Hitchc.	1A	6A 3C	14A 4T 5C	1A 1T 4C	1A				RMA	
Poa fendleriana (Steud.) Vasey		1A 1T 2C	10A 1T 6C	6A 1T 2C	4A 1T 2C	1A	1A	3A	RMA	
Poa glauca Vahl var. glauca			2A		2A	1A			RCMA	
Poa glauca Vahl var. rupicola (Nash ex Rydb.) B. Boivin	1A	7A 1T 4C	24A 1T 21C	9A 1T 5C	5A 5C	1A		8A 2T	RM	AE
Poa interior Rydb.		4A 3C	8A 1T 2C	3A 2T 2C	2A 1T 1C	1A	1A 1T	2A	RMA	
Poa leptocoma Trin.	1A	1C	2A 1T	1A 1C				1A	RCM	
Poa lettermanii Vasey		4C	1A 5C	5A	1C				RM	AE
Poa palustris L.		1A	1A						exotic	
Poa pratensis L. (except P. p. alpigena)		2A 1C	1C	4A	2A				exotic	
Poa pratensis L. ssp. alpigena (Lindm.) Hiitonen			2A						RCA	
Poa reflexa Vasey & Scribn.	1A 11T	2A 1T 4C	12A 1T 7C	1A 1C	2A	1A 1T	1T	2A	RM	
Poa secunda J. Presl ssp. juncifolia (Scribn.) Soreng					1C	1T			RMA	
Poa secunda J. Presl ssp. secunda	1A	9A 1T 3C	9A 7C	9A 3T	3A 1T				RMA	
Poa wheeleri Vasey		3A 1C	10A 4T 2C	1A 1T	1A	1A			RM	
Podagrostis humilis (Vasey) Bjoerkman		5C	4C		1A				RM	
Ptilagrostis porteri (Rydb.) W.A. Weber[1]			1C						R	SRxE
Trisetum montanum Vasey			1C		2A				R	
Trisetum spicatum (L.) K. Richt.	1A	22A 1T 6C	33A 4T 15C	18A 4T 6C	12A 1T 4C	1A 1T	1A 1T	8A 3T	RCMA	
Trisetum wolfii Vasey		1C							RM	
Vahlodea atropurpurea (Wahlenb.) Fr. ex Hartm.		2A 1C	1A 2C						RC	
Polemoniaceae										
Aliciella pinnatifida (Nutt. ex A. Gray) J.M. Porter			2A 1C	3A	1A 1C				RMA	
Aliciella sedifolia (Brandegee) J.M. Porter[1]				1A 2C					R	SRxE-AE
Ipomopsis spicata (Nutt.) V.E. Grant ssp. capitata (A. Gray) V.E. Grant			5A 6C						R	SRxE-AE
Leptosiphon nuttallii (A. Gray) J.M. Porter & L.A. Johnson ssp. nuttallii			1A		1C				RM	
Phlox condensata (A. Gray) E.E. Nelson			21A 3T 11C	7A 2C	14A 2C			2A 2T	RM	
Phlox pulvinata (Wherry) Cronquist	1T	2A 4C		11A 4T	7A			4A	RM	
Phlox vermejoensis Legler								1A	R	SRxE-AE
Polemonium brandegeei (A. Gray) Greene		3C	1C		1A				R	
Polemonium confertum A. Gray			18A 1T 6C	3A 1T 3C	1A 2C				R	SRxE
Polemonium pulcherrimum Hook. var. delicatum (Rydb.) Cronquist		5A 3T 2C	14A 8T 5C	10A 7T 2C	5A	1A 1T		1A 1T	RM	
Polemonium viscosum Nutt.	1A 11T	18A 2T 5C	28A 3T 13C	19A 5T 7C	23A 1C	1A	1A 1T	7A	RM	
Polygonaceae										
Bistorta bistortoides (Pursh) Small	1A 11T	19A 1T 5C	33A 8T 13C	17A 6T 5C	12A 2T			5A 1T	RM	
Bistorta vivipara (L.) Delarbre	1A	5A 2C	15A 1T 11C	6A 3T 4C	13A 4C	1A		5A	RCMA	
Eriogonum arcuatum Greene var. xanthum (Small) Reveal		4A 2C	8A 1T 8C		1A 1T 2C			3A	R	SRxE
Eriogonum coloradense Small			1A 1C						R	SRxE
Eriogonum flavum Nutt. var. flavum					3A				RA	

TABLE 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Eriogonum umbellatum Torr. var. aureum (Gand.) Reveal		1T	5A						RM	
Eriogonum umbellatum Torr. var. majus Hook.		1A	3A 2T 2C						RM	
Koenigia islandica L.		7C	3C						RC	
Oxyria digyna (L.) Hill	1A 11T	22A 1T 3C	25A 1T 10C	12A 2T 5C	15A 1T 3C	1A	1A 1T	5A 1T	RCMA	
Polygonum aviculare L.				2A					exotic	
Polygonum douglasii Greene		2C	1C	1A 1T	1A				RMA	
Rumex acetosella L.					1A				exotic	
Rumex densiflorus Osterh.			1C	1C					R	
Rumex utahensis Rech. f.			1A						RM	
Portulacaceae										
Claytonia lanceolata Pursh		1C	1A 2C						RM	
Claytonia megarhiza (A. Gray) Parry ex S Watson		8A 1C	35A 3T 17C	18A 4T 7C	19A	1A		6A 1T	RM	
Lewisia pygmaea (A. Gray) B.L. Rob.		5A 1T 4C	16A 4T 4C	9A 3T 4C	4A	1T		3A	RM	
Lewisia rediviva Pursh var. rediviva			1A						RM	
Primulaceae										
Androsace chamaejasme Wulfen ssp. lehmanniana (Spreng.) Hultén[2]		2C	2A 3C		16A 6C	1A		8A 1T	RC	
Androsace septentrionalis L.		17A 4T 2C	21A 5T 8C	17A 5T 7C	15A	1A 1T	1A	6A 1T	RCMA	
Dodecatheon pulchellum (Raf.) Merrill var. pulchellum					4A			3A	RCMA	
Primula augustifolia Torr.		4C	13A 1T 12C		15A 1T 3C			7A 1T	R	SRxE-AE
Primula parryi A. Gray		7A 1T 3C	16A 9C	9A 2T 4C	6A 1C		1A		RM	
Ranunculaceae										
Aconitum columbianum Nutt. ssp. columbianum		1A 1T	4A 1T 2C	4A 1C					RM	
Actaea rubra (Aiton) Willd.		1C			1A				RCMA	
Anemone multifida Poir. var. multifida		3A 1T	14A 4T 3C	2A 2C	1A				RCM	
Anemone multifida Poir. var. stylosa (A. Nelson) B.E. Dutton & Keener		1T 1C				1A	1A 1T		RM	
Anemone narcissiflora L. var. zephyra (A. Nelson) B.E. Dutton & Keener		7A 1C	22A 2T 11C						R	
Anemone parviflora Michx.			3A 3C						RC	
Anemone patens L. var. multifida Pritz.	1A	3A 3C	7A 2T						RCA	
Aquilegia chrysantha A. Gray							1T		RM	
Aquilegia coerulea E. James var. coerulea	1A 11T	15A 1T 1C	28A 5T 5C	14A 5T 5C	12A			3A	R	SRxE
Aquilegia elegantula Greene			1A 1T						RM	
Aquilegia saximontana Rydb.		3C	5C						R	SRxE
Aquilegia scopulorum Tidest.				1A					RM	
Caltha leptosepala DC.	1A	11A 2T 4C	19A 3T 6C	14A 4T 2C	10A 1C			4A	RM	
Delphinium alpestre Rydb.[5]			3A 2C		4A 2C			4A	R	SRxE-AE
Delphinium barbeyi (Huth) Huth		1A 2C	6A 2T 2C	2A 1T 2C					RM	
Delphinium ramosum Rydb.					2A				R	
Ranunculus abortivus L.	1A								RA	

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Ranunculus adoneus A. Gray		16A 3T 5C	12A 2T 9C						RM	
Ranunculus alismifolius Geyer ex Benth. var. montanus S. Watson		4A 2T 1C	3C	8A 4T 5C					RM	
Ranunculus eschscholtzii Schltdl.	1A	4A 1T	3A 1T 4C	1A 2C					RC	
Ranunculus gelidus Kar. & Kir.			6C						RC	
Ranunculus hyperboreus Rottb.			2A						RC	
Ranunculus inamoenus Greene var. inamoenus		1A 1T 1C	4A 2T 3C	3A 1T 2C	1A 1C				RM	
Ranunculus inamoenus Greene var. subaffinis (A. Gray) L.D. Benson							1T		R	SRxE
Ranunculus macauleyi A. Gray		1A	3A 2C	14A 2T 4C	11A 3C			8A 2T	R	SRxE
Ranunculus pedatifidus Sm. var. affinis (R. Br.) L.D. Benson		1A 2C	4A 1T 5C	5A 1T	5A		1A		RCA	
Ranunculus pygmaeus Wahlenb.		2C	1A 4C						RC	
Thalictrum alpinum L.		1A 1C	7A 8C	2A 2C	7A 1C			3A	RCM	
Trollius albiflorus (A. Gray) Rydb.	1A	2A 2T 5C	5A 1T 6C	3A 1T 4C	1A				R	
Rosaceae										
Dasiphora fruticosa (L.) Rydb.	1A	2A	19A 5T 3C	3A 1T	12A			4A	RCMA	
Dryas hookeriana Juz.		9A 5C	18A 4T 9C	2A 1C	2A 4C				RC	
Drymocallis glabrata Rydb.			1A 1T						RM	
Fragaria vesca L.					1A 1T				RCM	
Fragaria virginiana Mill.		1A 1T 1C	6A 2T 2C	5A 3T	1A	1T			RCMA	
Geum macrophyllum Willd. var. perincisum (Rydb.) Raup				3A					RCM	
Geum rossii (R. Br.) Ser. var. turbinatum (Rydb.) C.L. Hitchc.	1A 11T	31A 1T 11C	47A 4T 18C	19A 3T 5C	25A 2T 1C	1A	1A 1T	8A 1T	RM	
Geum triflorum Pursh var. ciliatum (Pursh) Fassett		1A	2A 1T	3A 1T					RM	
Geum triflorum Pursh var. triflorum			2A						RA	
Holodiscus dumosus (Nutt. ex Hook.) A. Heller		1T			1A			1A 1T	RM	
Ivesia gordonii (Hook.) Torr. & A. Gray		5A	4A 2C	1C	1A 1C				RM	
Petrophyton caespitosum (Nutt.) Rydb.		1A							RM	
Potentilla concinna Richardson var. concinna		6A 2T 1C	2A 1T 3C	3A 1T 2C	5A 1T 1C			6A 1T	RMA	
Potentilla diversifolia Lehm. var. diversifolia	1A 11T	23A 3T 5C	26A 6T 18C	19A 5T 5C	10A 1T 1C	1A	1A 1T	4A 1T	RM	
Potentilla gracilis Douglas ex Hook. var. fastigiata (Nutt.) S. Watson		1A	2A	2A					RM	
Potentilla gracilis Douglas ex Hook. var. pulcherrima (Lehm.) Fernald		4A 1C	7A 3T 1C	3A 2T 4C	5A 1T	1A 1T		3A	RM	
Potentilla hippiana Lehm. var. hippiana		2A	1A	1A					RMA	
Potentilla hookeriana Lehm.	1A 11T	7A 5C	6A 14C	11A 3C	7A	1A	1A	1A	RM	
Potentilla modesta Rydb.	1A								RM	
Potentilla ovina Macoun var. ovina		1A 1C	1A 1T 10C		1C	1A			RM	
Potentilla paucijuga Rydb.						1A			R	SRxE
Potentilla pensylvanica L.		3A 1T	3A		1A 1C	1A			RCM	
Potentilla plattensis Nutt.		1A			1A				RCMA	
Potentilla saximontana Rydb.	1A	6A 2T 1C	13A 1T 7C	8A 1T 1C	12A 1T	1A			R	SRxE-AE
Potentilla subjuga Rydb.	1A	3A 1C	7A 2T 13C	5A 1T 1C	6A 1T 2C			3A	R	

TABLE 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Potentilla uniflora Ledeb.		3A 3C	4A 8C	1A	4A				RC	
Rubus idaeus L. var. aculeatissimus Regel & Tiling		3A 1T	2A 1C	1A	1A			1A1T	RCMA	
Sibbaldia procumbens L.	1A 11T	17A 3T 5C	29A 4T 12C	18A 6T 6C	15A 1C	1A 1T	1A	9A 3T	RCM	
Rubiaceae										
Galium boreale L.					1A				RCMA	
Salicaceae										
Populus tremuloides Michx.		1C	1A 1T						RCMA	
Salix arctica Pall. var. petraea (Andersson) Bebb	1A	12A 7C	22A 2T 15C	13A 1T 3C	4A 1C			5A 1T	RM	
Salix brachycarpa Nutt. var. brachycarpa	1A 11T	6A 6C	15A 2T 12C	7A 4T 6C	6A 1T 1C				RCM	
Salix calcicola Fernald & Wiegand			2C						RC	disjunct
Salix cascadensis Cockerell	1A 11T	1A							R	disjunct
Salix glauca L. var. villosa Andersson	1A 11T	10A 1T 4C	12A 5T 3C	3A 1C	2A				RC	
Salix monticola Bebb		1A	1A						RM	
Salix planifolia Pursh	1A 11T	6A 5C	11A 2T 8C	9A 3T 4C	2A 1C			2A	RCMA	
Salix reticulata L. var. nana Andersson		10A 7C	19A 5T 8C	18A 6T 5C	12A 1T 3C	1A		5A	RM	
Saxifragaceae										
Chrysosplenium tetrandrum (Lund ex Malmgren) Th. Fr.		3C	3C						RC	disjunct
Heuchera bracteata (Torr.) Ser.		3A 1C	1A						R	SRxE
Heuchera hallii A. Gray			1A						R	SRxE
Heuchera parvifolia Nutt. ex Torr. & A. Gray		7A 6C	25A 4T 16C	11A 4T 4C	20A 1T 4C			7A 1T	RM	
Heuchera rubescens Torr. var. versicolor (Greene) M.G. Stewart							1A 1T		RM	
Micranthes foliolosa (R. Br.) Gornall			2C						RC	disjunct
Micranthes odontoloma (Piper) A. Heller			1A						RM	
Micranthes oregana (Howell) Small			7A 1T 3C		1A				RM	disjunct
Micranthes rhomboidea (Greene) Small	1A 11T	10A 1T 4C	32A 6T 14C	21A 4T 4C	17A 1C	1A 1T	1A	6A 1T	RM	
Saxifraga adscendens L.		3C	2A 6C	5C					RCM	
Saxifraga bronchialis L. var. austromontana (Wiegand) Piper ex G.N. Jones		14A 1T 2C	20A 4T 5C	6A 3T 3C	14A 1C	1A		8A 1T	R	
Saxifraga cernua L.		2A 2C	9A 9C	6C	8A 1T 2C			4A	RCMA	
Saxifraga cespitosa L.		5A 2C	7A 11C	2A 3C	9A 3C	1A		2A	RCM	
Saxifraga chrysantha A. Gray	1A	4A 6C	10A 10C	1A 1C	6A 3C			4A	R	
Saxifraga debilis Engelm. ex A. Gray		2A 4C	4A 1T 6C	5A 1T 6C	5A 1C	1T	1A	3A	R	
Saxifraga flagellaris Willd. ex Sternb.var. crandallii (Gand.) Dorn		3A 3C	11A 15C	8A 1T 3C	14A 2C		1A 1T	6A	RM	
Saxifraga hirculus L.			2C						RC	
Telesonix jamesii (Torr.) Rafinesque.			1C						R	SRxE
Scrophulariaceae										
Besseya alpina (A. Gray) Rydb.[7]	1A	5A 2C	23A 1T 14C	12A 1T 3C	15A 2C	1A		8A 1T	R	SRxE-AE
Besseya plantaginea (E. James) Rydb.		1A	2A		2A				R	
Besseya ritteriana (Eastw.) Rydb.				1A 1T 2C					R	SRxE
Castilleja haydenii (A. Gray) Cockerell				5A 3C	15A 6C			10A 1T	R	SRxE-AE

Table 2. (continued)

Subregions Family/Species	WY (n=1)	n CO (n=119)	c CO (n=98)	sw CO (n=40)	se CO (n=33)	UT (n=1)	AZ (n=1)	NM (n=14)	Floristic Region	Endemic
Castilleja miniata Douglas ex Hook. var. miniata		5A 1T 1C	7A 1T	9A 5T	2A				RCM	
Castilleja occidentalis Torr.		25A 2T 7C	48A 5T 17C	15A 4T 5C	16A 5C	1A 1T		8A 2T	R	
Castilleja puberula Rydb.		4C	2C						R	SRxE
Castilleja rhexifolia Rydb.		11A 1T 5C	18A 2T 10C	11A 3T 4C				1A	RM	
Castilleja sulphurea Rydb.		5A	8A 1T 1C	4A 1T	3A 2T 1C	1A			RM	
Chionophila jamesii Benth.	1A 11T	5A 7C	13A 12C	7A 1T 4C	7A 1T 2C			5A	R	SRxE-AE
Mimulus guttatus DC.		3A 2C	2C	5A 3C	1A 1T				RCM	
Pedicularis bracteosa Benth. var. paysoniana (Pennell) Cronquist		2A 2C	6A 2T 1C	4A 1T 1C					R	
Pedicularis groenlandica Retz.	1A	10A 1T 2C	20A 2T 4C	12A 3T 4C	7A 1T 3C			3A	RCM	
Pedicularis parryi A. Gray var. mogollonica (Greene) Dorn				8A 1T	1A				RM	
Pedicularis parryi A. Gray var. parryi	1A	9A 1T 5C	30A 6T 13C	4A 2T 4C	11A 7C		1A 1T	5A	RM	
Pedicularis procera A. Gray		1A	1A						RM	
Pedicularis racemosa Douglas ex Benth. var. alba (Pennell) Cronquist		1A 1C	3A 3T 1C	3A 3T 1C	1A				RM	
Pedicularis sudetica Willd. ssp. scopulorum (A. Gray) Hultén		3C	7A 9C	4A 1T 2C	1A 1C			2A	R	SRxE
Penstemon crandallii A. Nelson ssp. crandallii				1A					R	
Penstemon hallii A. Gray		1C	11A 1T 13C	7A 3C	2A 2C				R	SRxE
Penstemon harbourii A. Gray		1A 1C	5A 1T 6C	7A 1T 4C	1A 1C				R	SRxE-AE
Penstemon procerus Douglas ex Graham var. procerus		3A 1C	1A						RM	
Penstemon rydbergii A. Nelson			1C						RM	
Penstemon saxosorum Pennell		1A	1T						R	
Penstemon whippleanus A. Gray	1A 11T	22A 1T 4C	26A 7T 14C	12A 4T 4C	12A 2C	1A	1A 1T	6A	RM	
Veronica wormskjoldii Roem. & Schult.	1A	9A 5C	16A 1T 8C	12A 4T 5C	4A 1T 4C	1T		4A	RCMA	
Urticaceae										
Urtica dioica L. subsp. gracilis (Aiton) Selander		1C			1A				RCA	
Urtica dioica L. subsp. holosericea (Nutt.) Thorne					1A				RM	
Violaceae										
Viola adunca Sm.		1A 2T		2A 2T				3A	RCMA	
Viola biflora L.		4C	1C		1A 2C				RC	disjunct
Viola labradorica Schrank		3A 1C	6A 2T 4C	6A 1T 5C	4A 1C				RCA	disjunct
Viola palustris L.		1A							RCM	
Viola praemorsa Douglas ex Lindl.		1T	1A 1T						RM	

[1] USFS Sensitive Colorado
[2] USFS Sensitive Utah
[3] ESA listed Threatened
[4] may include M. lanceolata (Pursh) DC at treeline
[5] USFS Sensitive New Mexico
[6] may include *D. brevifolia* R.Br.
[7] USFS Sensitive Wyoming

represent approximately half of the species richness of larger mountain systems. Future synthesis of the Middle Rockies floristic inventories at the RM may clarify the discrepancy between the Scott (1995) and Hadley (1987) estimates, but our results seem to fit the broader alpine pattern.

The checklist (Table 2) is based on vouchered specimens and should be most useful to botanists and land managers determining what taxa are likely to occur within their area of interest. The frequency values within Table 2 are best interpreted as relative probabilities for within taxon comparisons between subregions or between alpine meadow and treeline ectotone areas within the alpine zone of a subregion. Relative probability of occurrence between taxa should be limited to small discrete areas of interest. The overall lower number of occurrences within the treeline ecotone probably reflects its relative narrowness compared to more expansive alpine meadow and talus slopes. We caution against over interpretation of the frequency counts. Some taxa with a high number of occurrences, such as *Achillea millefolia* and *Cymopterus lemmonii*, are common in lower elevation habitats as well as in the alpine zone. Other high occurrence taxa, such as *Geum rossii*, are predominantly alpine zone species. Similarly, a low number of occurrences could indicate taxa that infrequently range up to the treeline ecotone, taxa that are narrowly distributed geographically, or prominent tree species that are less often collected.

The levels of endemism and floristic region distribution (Table 2) provide a convenient synthesis of the best available knowledge for botanists and biodiversity managers that recommend TES designations based on geographic distribution. Most of the U.S. Forest Service Sensitive species (Table 2) have some level of endemism within the Southern Rockies. The 25 taxa endemic to the alpine zone of the Southern Rockies would also make a key set of biogeographic/population ecology/species migration studies for the effects of future climate change and possible species loss.

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